

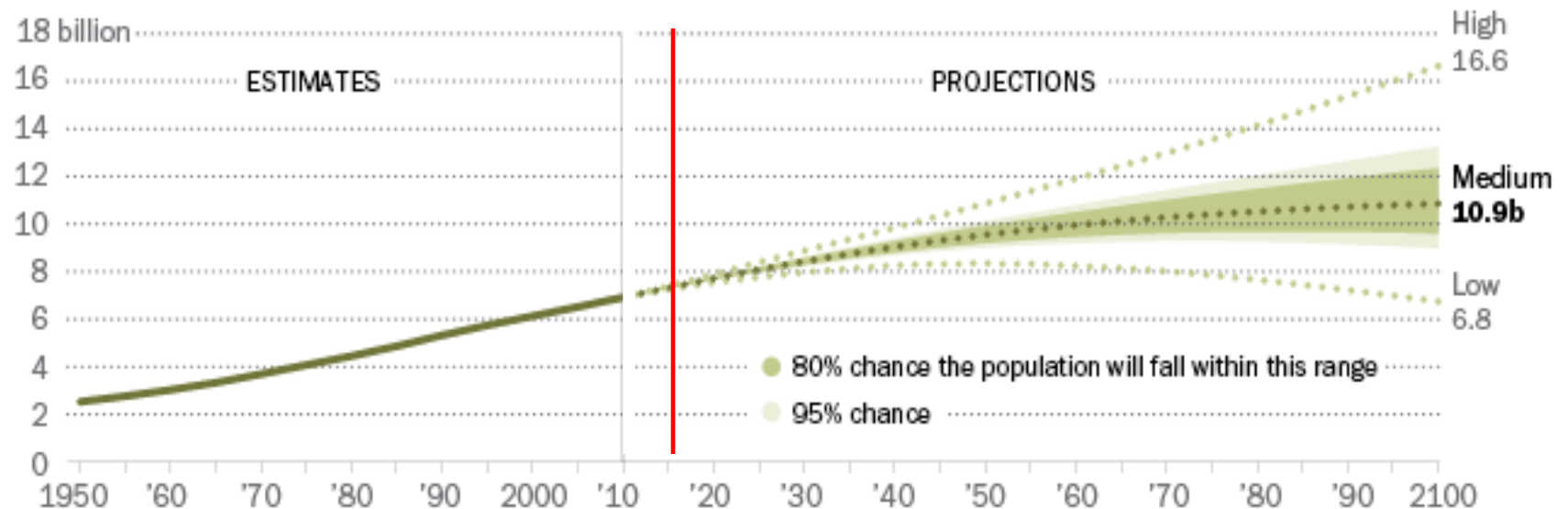
New Opportunities for Pulse Crop Economic Development

Montana Pulse Day
December 9, 2015

World Population Increase

World Population, 1950-2100

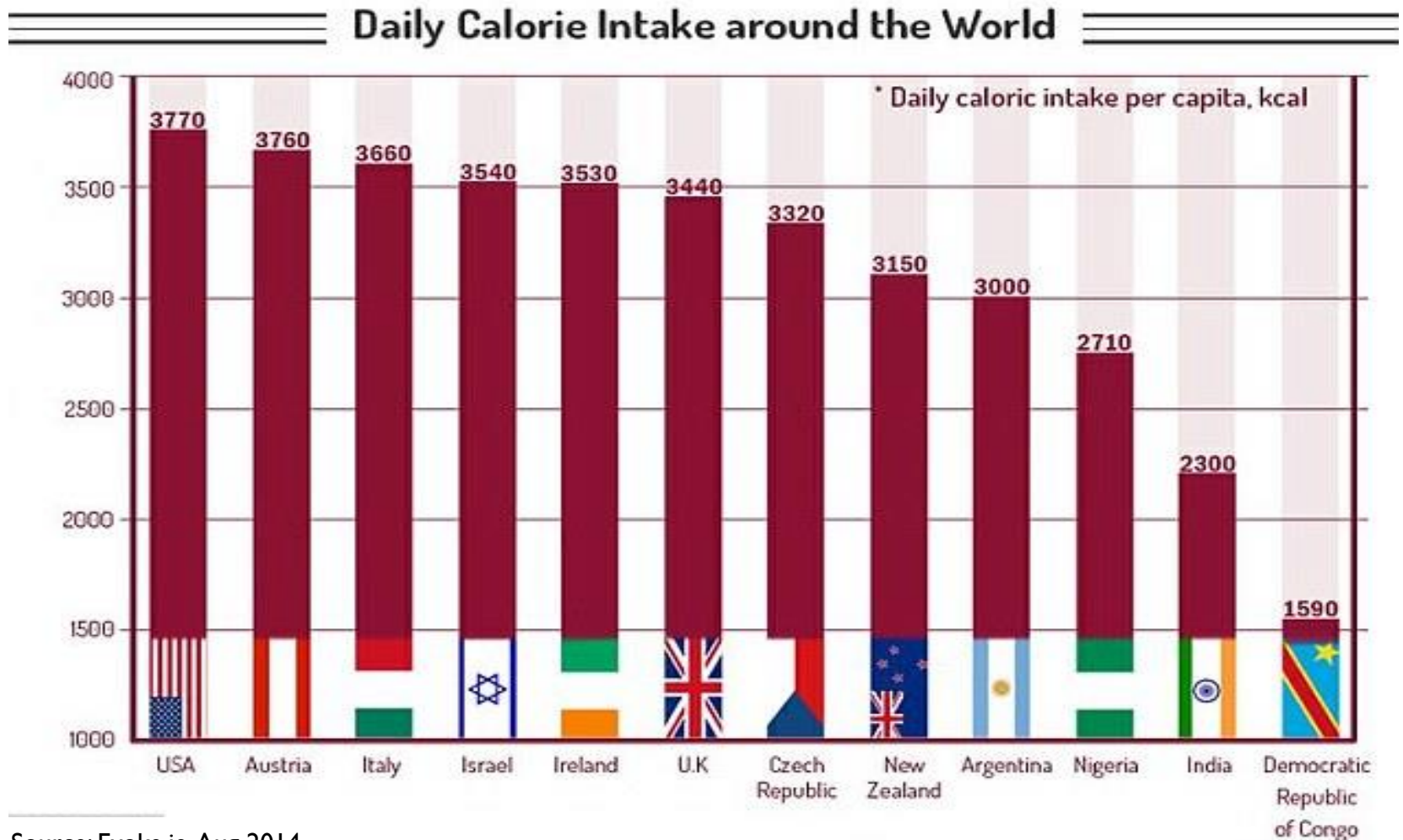
Estimated and projected annual world population



Source: United Nations Population Division World Population Prospects, 2012 Revision; "World Population Stabilization Unlikely This Century," *Science*, Oct. 10, 2014

PEW RESEARCH CENTER

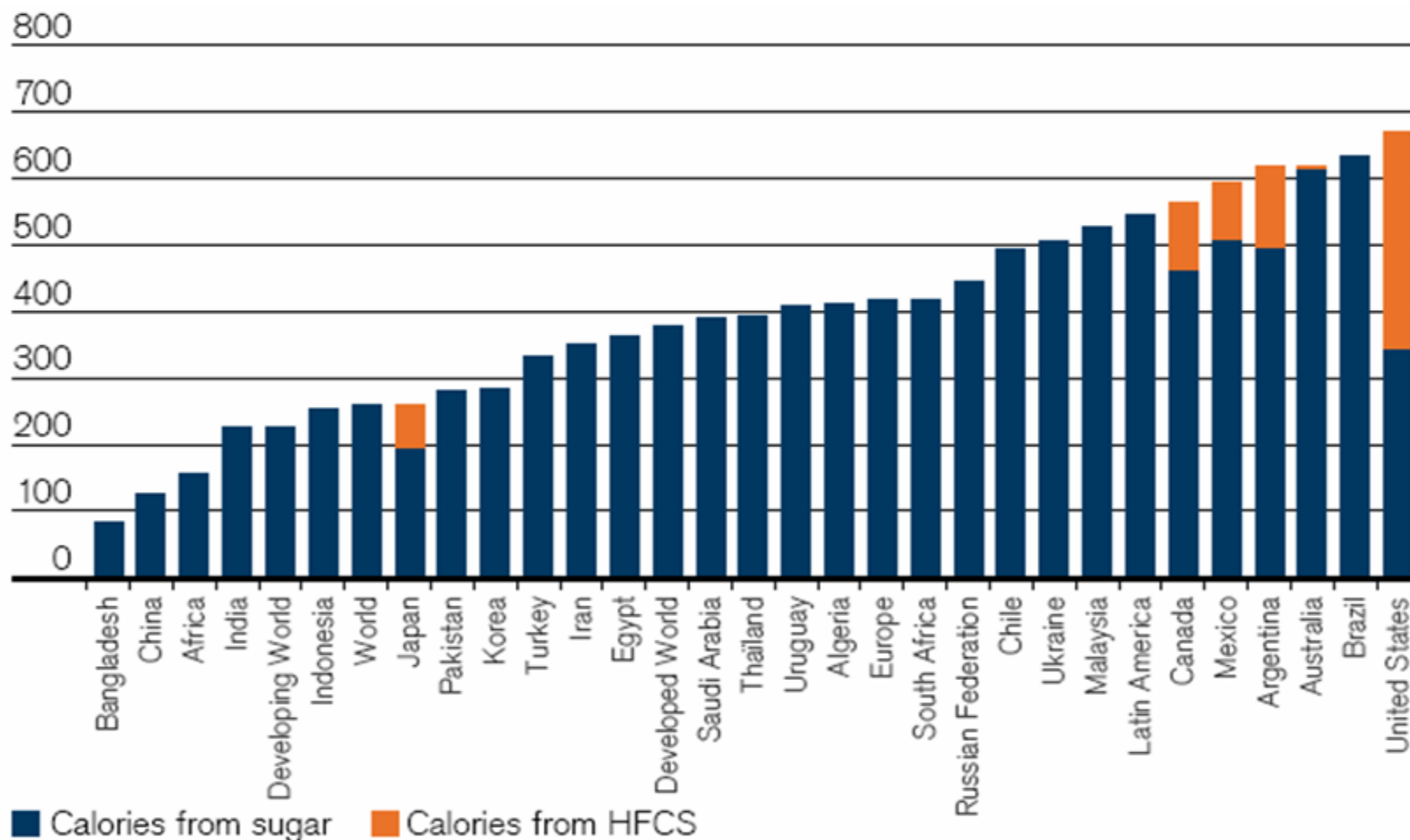
Web MD: 2,000 Calories for Women 2,400 Calories for Men



Source: Evoke.ie, Aug 2014

Simple Carbohydrate Intake

Average Daily Caloric Intake Of Sweeteners By Country



* Source: USDA-ERS, Conadesuca, OECD, Credit Suisse Research

Higher Demand for Calories

PER CAPITA CONSUMPTION

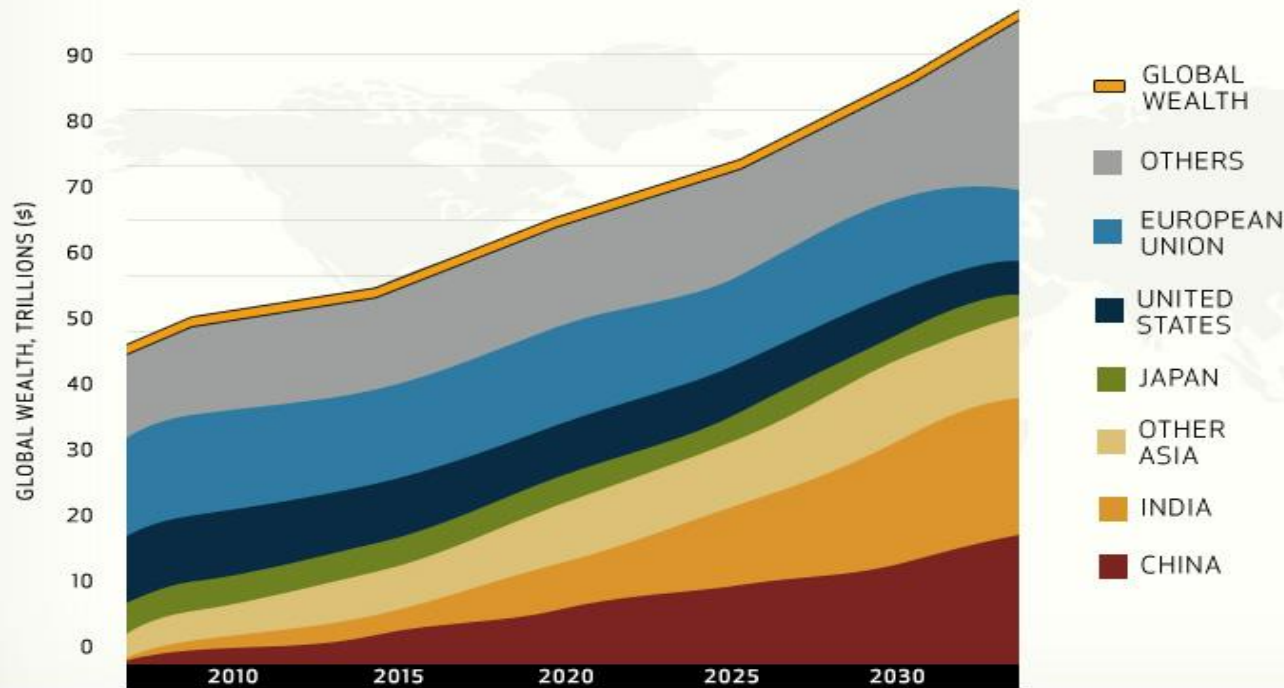
By 2030, average per capita food consumption in developing countries is expected to grow, with only one in seven people consuming less than 2500 calories per day.



Interesting Food Facts

- ▶ By 2030, global food demand is expected to rise by 35%.

FOOD DEMAND



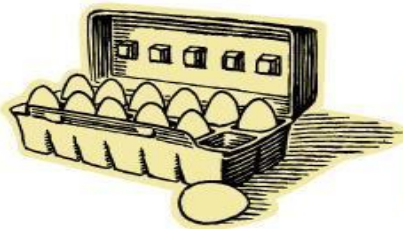
By **2030**, the global economy could double in size, and India and China will swell to represent around 40% of global middle-class consumption, up from less than 10% in 2010. This will significantly alter the composition of global diets.

Interesting Food Facts

► “Free From” - Foods and Beverages



Peanuts



Egg



Milk



Fish



Shellfish



Wheat



Soy



Tree Nuts

Interesting Food Trend

- ▶ **Clean Food – Simple Food**
- ▶ **Ingredients:** White Boneless Chicken, Water, Food Starch-Modified, Salt, Seasoning (Autolyzed Yeast Extract, Salt, Wheat Starch, Natural Flavoring [Botanical Source], Safflower Oil, Dextrose, Citric Acid), Sodium Phosphates, Natural Flavor (Botanical Source). Battered and Breaded with: Water, Enriched Flour (Bleached Wheat Flour, Niacin, Reduced Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Yellow Corn Flour, Bleached Wheat Flour, Food Starch-Modified, Salt, Leavening (Baking Soda, Sodium Acid Pyrophosphate, Sodium Aluminum Phosphate, Monocalcium Phosphate, Calcium Lactate), Spices, Wheat Starch, Dextrose, Corn Starch.



Interesting Food Trends

- ▶ Protein – Vegetable and Animal
- ▶ Fiber and Resistant Starches
- ▶ Healthy Fats – Omega 3/6/9 Balance
- ▶ Vitamins, Minerals, Nutrients
- ▶ Water



Interesting Food Trends

► Sustainability

n., the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs.



Interesting Food Trends

► Food Safety



Pulse Crops Nutrition Profile

Nutritional profile of pulses and cereal grains

g/100g dry weight basis

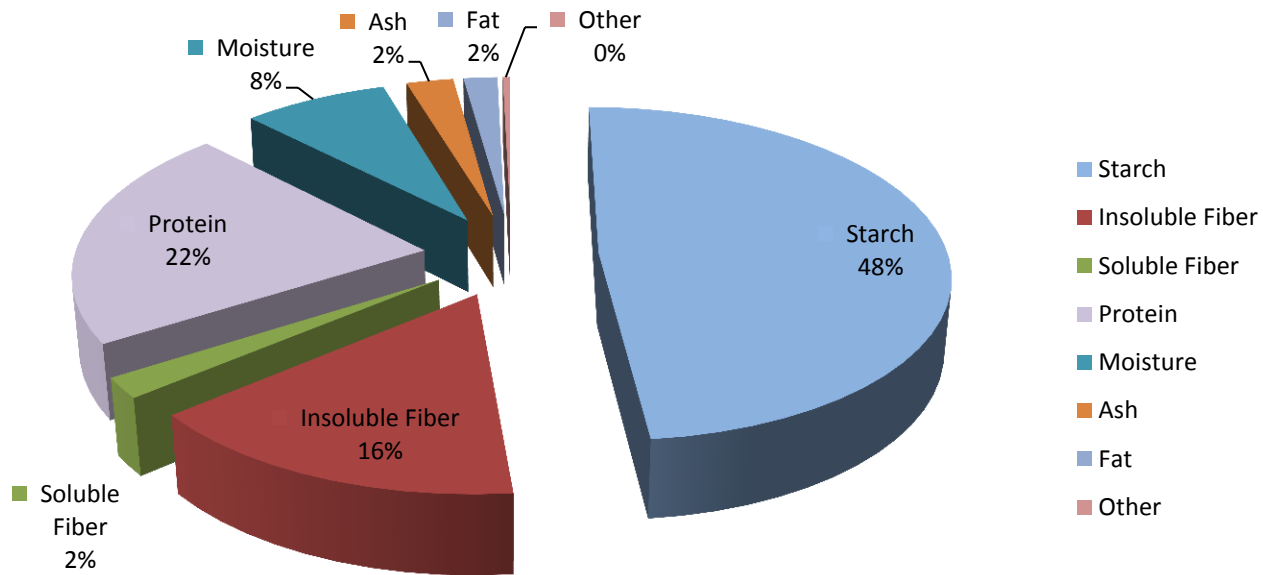
	Protein	Fat	Carbohydrate	Fiber
Peas	23	1	60	16
Beans*	23-26	1-2	67-71	17-28
Lentils	26	1	60	14
Chickpeas	22	7	69	19
White rice	8	1	90	1
Brown rice	9	3	85	4
Wheat	15	3	83	13
Oats	18	8	72	12

*includes kidney, black, cranberry, pinto and navy beans

Sources: Wang and Daun, U.S.D.A. National Nutrient Database for Standard Reference, and Health Canada Canadian Nutrient File

Nutritional Appeal of Pulse Crops

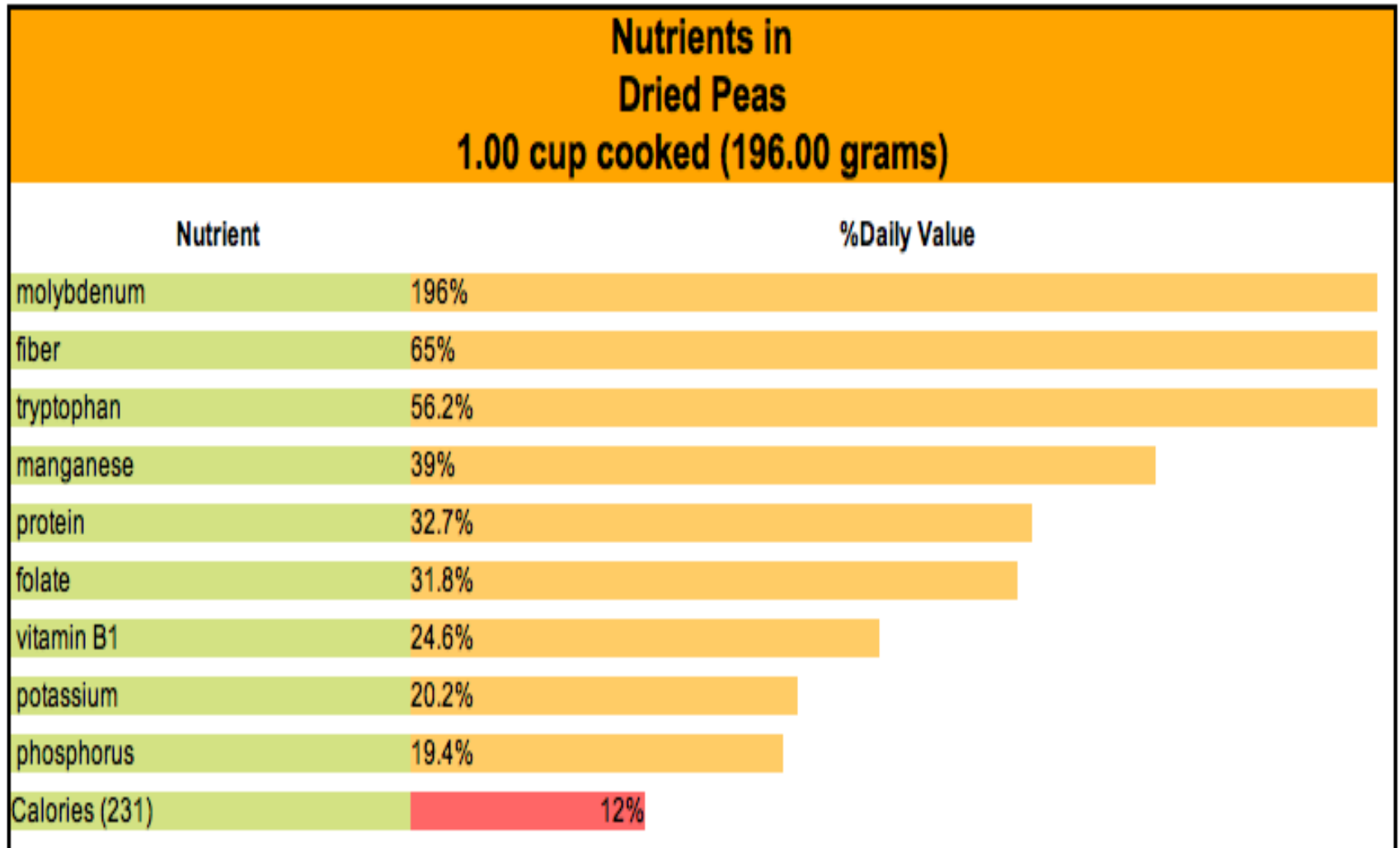
% Components of Peas



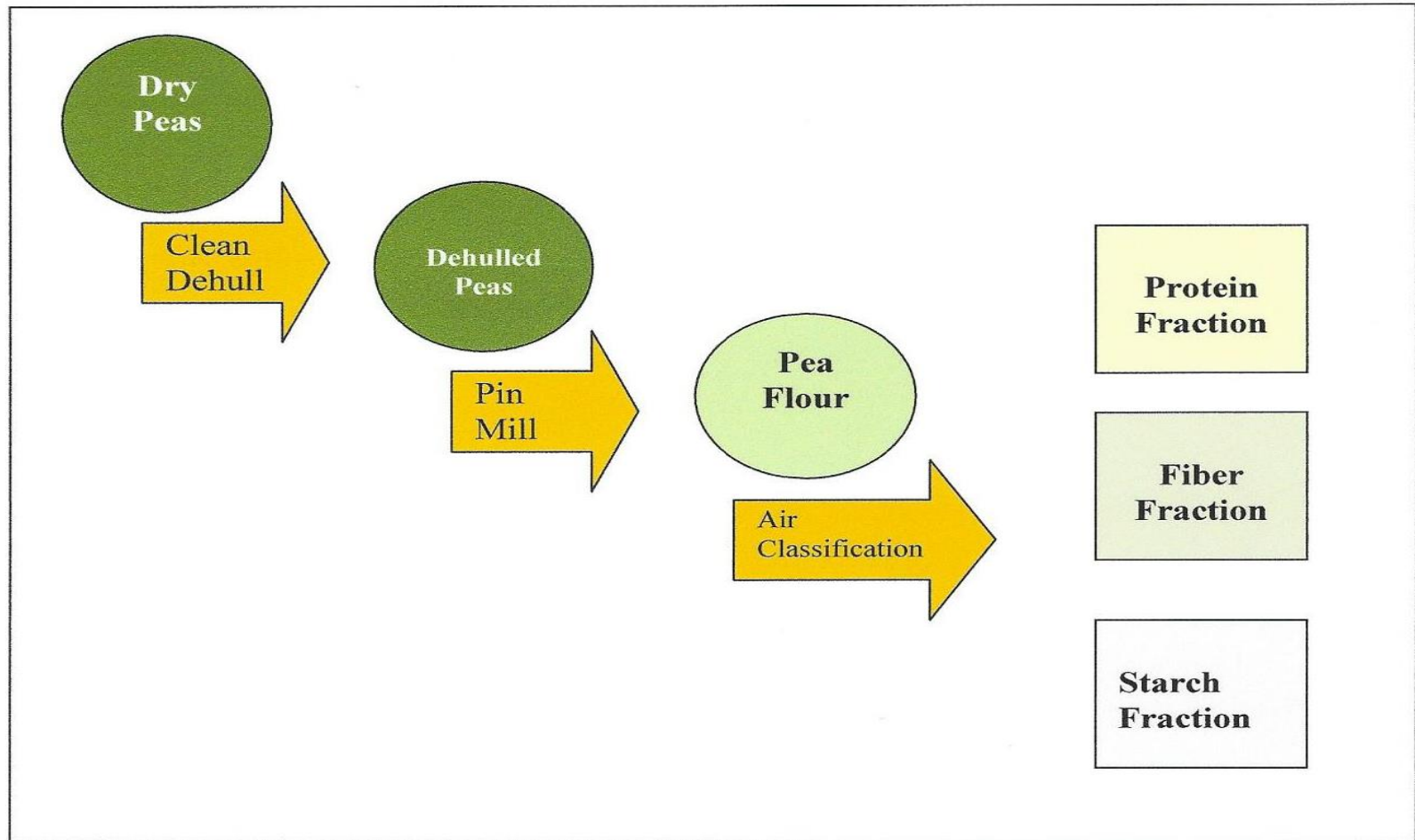
- ▶ Components of Peas
 - ▶ Source: USDA Nutrient Database
-



Dry Pea Nutrition



Dry Pea Fractionation Process



Dry Fractionation Process

Product	% Moisture	% Protein	% Starch/Sugars	% Fiber	% Ash	% Fat
Whole Peas	8	22	48	18	2	2
Protein Fraction	9	53	30	1	5	2
Fiber Fraction	8	2	1	87	2	0
Starch Fraction	9	12	75	1	2	1

Table 3: Dry Fractionation Process – Fraction Nutrient Composition
Source: Pulse Canada



Wet Fractionation Process

Product	% Moisture	% Protein	% Starch/Sugars	% Fiber	% Ash	% Fat
Whole Peas	8	22	48	18	2	2
Protein Fraction	Dry Basis	85	8	1	4	2
Fiber Fraction	8	2	1	87	2	0
Starch Fraction	Dry Basis	1	99	0	0	0

Wet Fractionation Process – Fraction Nutrient Composition

Source: USDA Nutrient Database for Standard Reference



Pea Protein Isolate

CLEAN TASTE

- Neutral flavor and aroma characteristics
- Easy to formulate great tasting products

FUNCTIONALITY

- 100% soluble and transparent in low pH beverages
- Heat stable
- Low in viscosity

NUTRITION

- Excellent amino acid profile
- Contains all the essential amino acids
- Quality plant protein nutrition

LABEL FRIENDLY

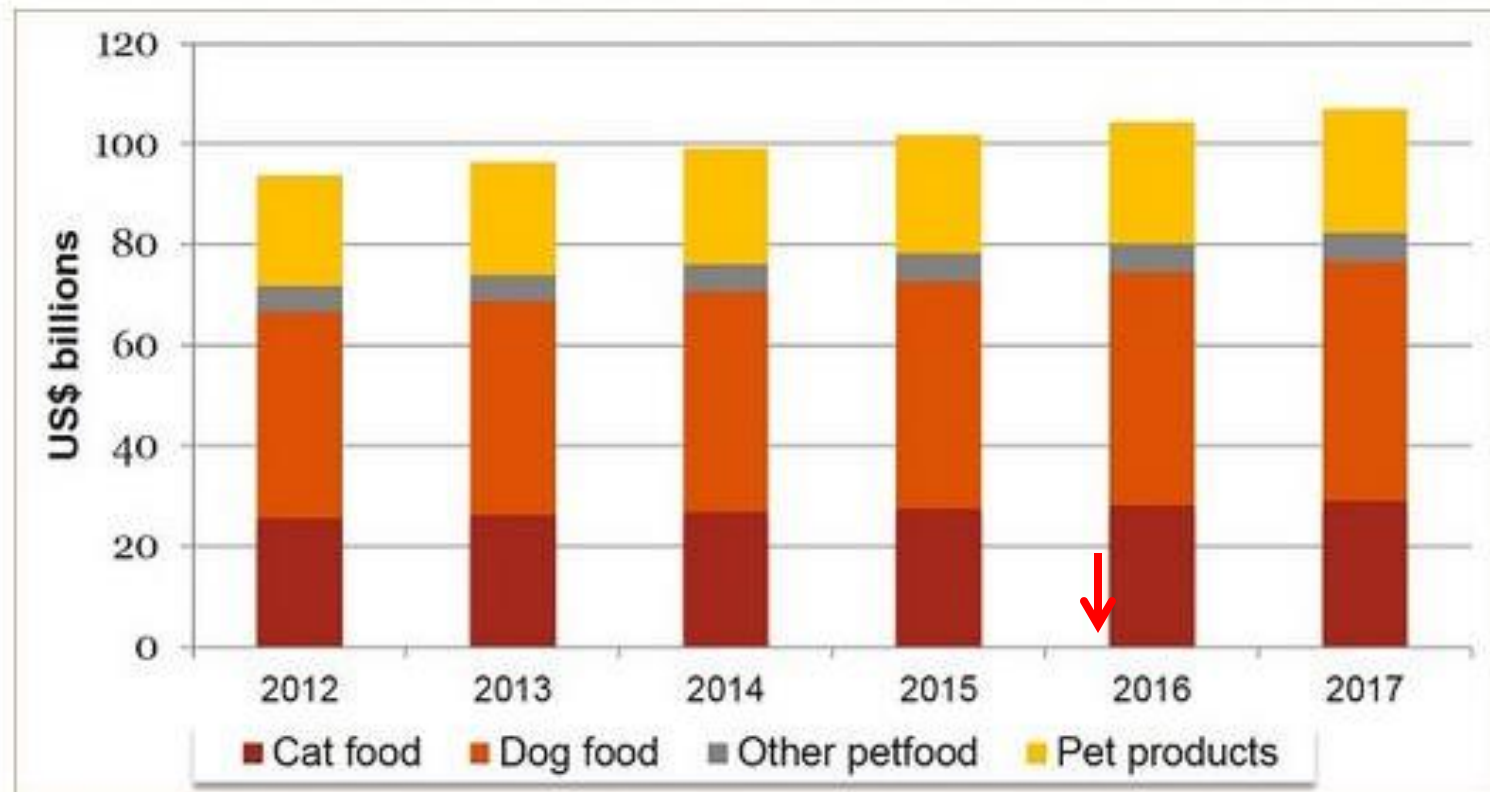
- Hypoallergenic
- Sourced from non-GMO field peas



Pet Food Formulations



U.S. Pet Food Sales



- ▶ U.S. Pet Product Growth Projections 2012-2017
- ▶ Source: Euromonitor International

Pulse Flours



Baked Goods



Snack Chips and Crackers



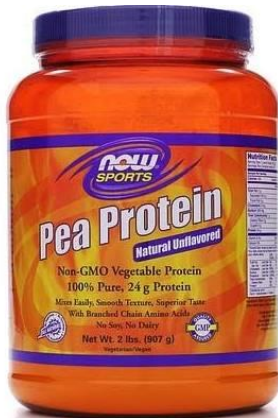
Spreads, Dips, and Butters



Meat Free Proteins



Protein Supplements

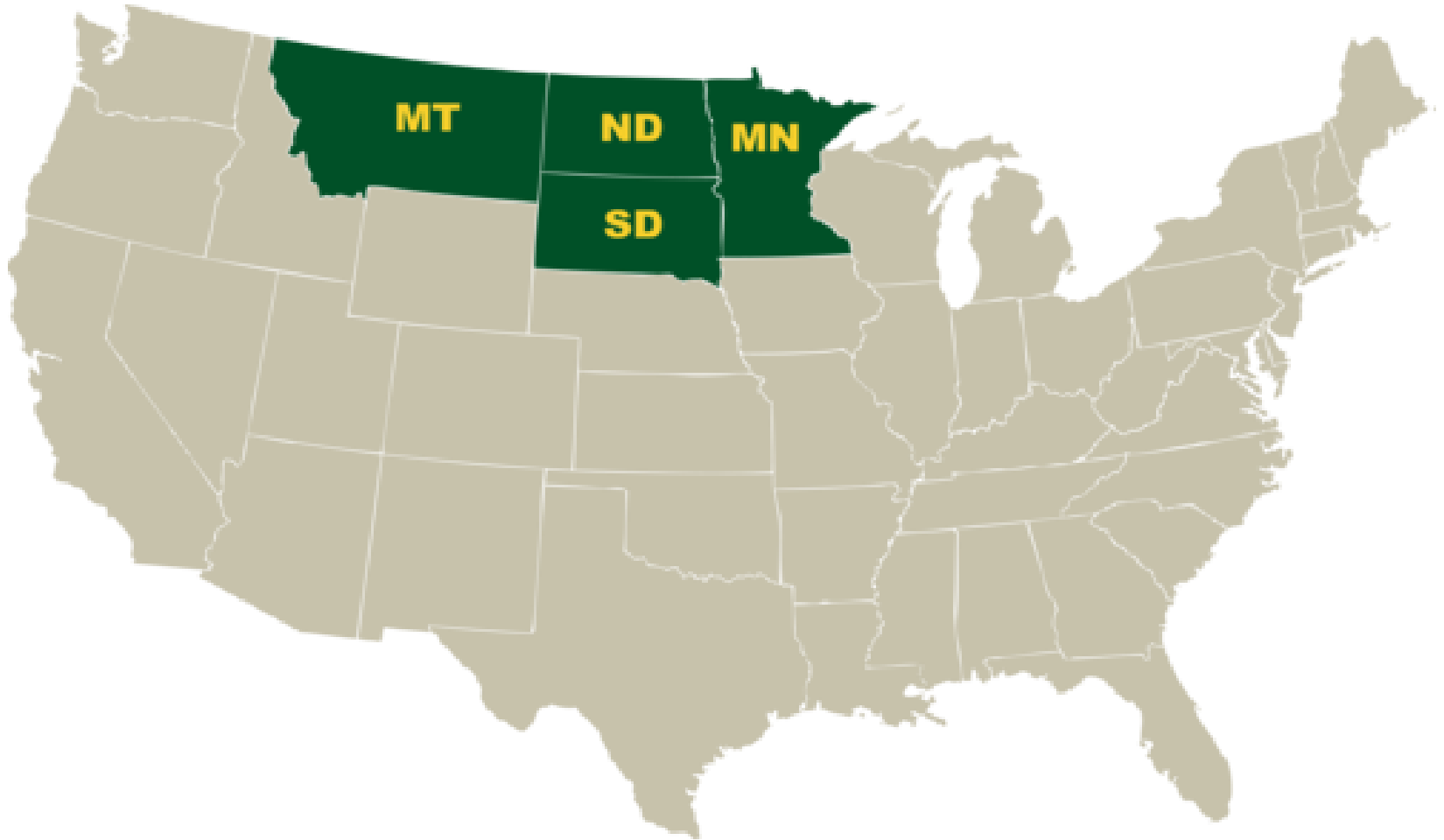


Opportunities in Food Manufacturing

- ▶ Provide the World with Excellent Nutritional Value for Optimum Health and Wellness



Northern Crops Institute



Northern Crops Institute



Northern Crops Institute

▶ Contact

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